AR201-1254965

ROBUST SUMMARY
ALKYL SULFIDE CATETGORY
CAS # 68511-50-2
ECOTOXICITY ELEMENTS: TOXICITY TO AQUATIC PLANTS

Test Substance	
CAS #	68511-50-2
Chemical Name	1-propene, 2-methyl-, sulfurized
Remarks	This substance is also referred to as methyl propene derivative in HERTG's Test Plan for Alkyl Sulfide Category. For more information on the chemical, see Section 2.0 "Chemical Description of Alkyl Sulfide Category" in HERTG's Test Plan for Alkyl Sulfide Category.
Method	
Method/Guideline followed	Test protocol followed US EPA Toxic Substances Control Act Test Guideline #797.1050 (1985, 1987), OECD Guideline for Testing of Chemicals #201 Alga, Growth Inhibition Test (1984).
Test Type	WAF static non-renewal test
GLP (Y/N)	Y
Year (Study Performed)	1994
Species/Strain	Freshwater algae, *Pseudokirchneriella subcapitata* formerly called *Selenastrum capricornutum*
Element basis (# of cells/ml)	~10,000 cells/ml
Exposure period/duration	96 hours
Analytical monitoring	Total organic carbon (TOC) measurements of initial test solutions and control (0-hour) and at test termination (96-h). EPA Method 415.1 (1979). Water samples were passed through 0.45 micron filter prior to TOC analysis.
Statistical Methods	
Remarks field for test conditions (fill as applicable)	Test Organisms: source – T.R. Wilbury in-house culture originally purchased from the University of Texas at Austin algae collection. Test System: Individual WAFs were prepared for each test level and renewed daily. A measured weight of test material was added to a measured volume of dilution water (1-L) in a glass vessel and stirred for 24 hours. Stirring accomplished using a Telfon coated magnetic stir bar. Mixing speed adjusted such that a vortex formed between 30 to 50% of the distance to the bottom. Following the mixing period, the test solutions were allowed to stand for 1 hour before the water phase was removed. To avoid removing test material from the surface or bottom, a siphon was placed in the mixing vessel prior to addition of water and test substance with the lower end 1-2 inches off the bottom. The siphoned water phase (i.e., WAF) was used for the aquatic toxicity test. A static test was conducted; i.e., there was no daily renewal of test solution. Three 100-mL replicates per treatment, inoculum ~10,000 cells/mL. The 250-mL Erlenmeyer flasks were stoppered with foam plugs to reduce entry of dust, etc. During the test all treatment and control flasks were randomly placed on an orbital shaker adjusted to approximately 100 cycles per minute under constant light (24 hours/day). Daily cell counts were made

visually by means of direct microscopic examination with a hemocytometer. Cool-white fluorescent lights provided a light intensity of 47 to 50 uEin/m^2sec.

At the conclusion of the 96-h test a 0.5 mL subsample of test media from each 100 mg/L test flask was combined with 100 mL of fresh untreated alga media and incubated for up to 9 days or as soon as growth occurs. This was done to determine if growth inhibition was algistatic or algicidal.

Dilution Water: Sterile enriched alga growth media (US EPA, 1978, T.R. Wilbury SOP #6) adjusted to pH 7.5. Measured TOC and total suspended solids in fresh untreated alga media were <1.0 and <10 mg/L, respectively. Test temperature – 23.4 to 23.6 C, pH – 7.0 to 7.1 at 0-hour and 8.6 to 10.2 after 96 hours. TOC measurements were only made on the lowest and highest test levels and control at the beginning and end of the test. TOC levels were <1.0 mg/L in the control and 1.0 mg/L WAF test level and 3 mg/L at 100 mg/L.

Test Levels: Control, 1.0, 5.0, 10, 50, 100 mg/L WAF loading rates.

Calculation of EL_{50} s and NOELRs: Moving average and probit methods (Stephan, 1983) were used to calculate EC_{50}s (i.e., EL_{50}s). A parametric one-way analysis of variance (ANOVA) and Dunnett's test were used to calculate the no-observed effect concentration (i.e., EL_0s) when data were normally distributed and a non-parametric Kruskal and Wallis test was used if data were not normally distributed.

Test Substance: No undissolved test material was seen on the surface of the test vessels during the entire aquatic toxicity test.

Reference Substance: No

Results

Measurements expressed as mg/L WAF loading rate:

	72-h EL_{50}	72-h NOELR[c]	96-h EL_{50}	96-h NOELR[c]
Cell Density:	26[a] (21-32)	5.0	34[b] (29-39)	10
Growth Rate:	>100	5.0	>100	10

[a] Moving average method. [b] Probit method.
Confidence limits in parentheses.
[c] Hypothesis analysis tests were used to determine NOELRs.

Re-growth of inhibited cultures from the 100 mg/L test level revealed the effect was algistatic rather than algicidal.

Remarks

Measured concentration: N/A

	Unit: mg/L WAF loading Element value: EL_{50} and NOELR (i.e., no-observable effect loading rate). • EL_{50}s and NOELRs reported as EC_{50} and NOEC, respectively, although test results were based on WAF loading rates. • Test concentrations for the definitive test were not specified in a protocol amendment and the pH of the sterile media at the start of the test was 7.0 rather than 7.5. These deviations did not compromise the study.
Conclusions	Re-growth of inhibited cultures from the 100 mg/L test level revealed the effect was algistatic rather than algicidal.
Data Quality	Reliable without restrictions
References	Chemical Manufacturers Association, HERTG
Other	Updated: 12-27-99